3.3.10 Wildland and Rangeland Fires

Wildland and rangeland fires are hazards that impact Montana every year. In mild fire seasons, there may be relatively small timber and crop resource losses. In extreme years, there can be resource devastation, habitat destruction, structure losses and deaths. Historically, fire has been an integral part of forest and grassland regeneration. Fire plays an important role in the growth and generation of healthy forest and grassland habitats.

A **wildland or rangeland fire** is an uncontrolled fire, a term which includes grass fires, forest fires, and scrub fires, be they man caused or natural in origin. The **wildland/urban interface (WUI)** is defined as the zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.

3.3.10.1 Background

- As residential areas expand into relatively untouched wildlands, people living in the wildland/urban interface are increasingly threatened by forest fires. Protecting structures in the wildland from fire poses special problems and can exhaust firefighting resources.
- Montana Department of Natural Resources and Conservation (MDNRC) data for fire starts from 1994 through 2003 show 53% of wildfires were started by lightning. Other major human caused ignition sources were debris burns (13%); campfires (10%); railroad starts (3%); and equipment caused fires (3%) (MDNRC, 2004b).
- Since 1933, 38 wildland fire fatalities have occurred in Montana. Twenty of these deaths were from burnovers (such as the Mann Gulch Tragedy), 7 were in aircraft crashes, 5 from falling snags, 2 in motor vehicle accidents, 2 from training accidents, 1 from hypothermia, and 1 from a heart attack (NIFC, 2004)
- Forest fuels are of primary concern in Western Montana where crown fire potential is high in many areas, including some areas along the wildland/urban interface. In the valleys and agricultural areas of western Montana, sagebrush and dry grass may also provide sufficient fuels for wildfires.
- Dry grass, associated with rangeland and farmland Conservation Reserve Program (CRP), is a primary fuel for eastern Montana wildfires. The rate of fire spread varies directly with wind speed. The windy conditions typical to the region can cause wildfires to spread rapidly. In addition, eastern Montana has areas of ponderosa pine, sagebrush, and other fuels subject to wildfires.
- If heavy rains follow a major fire in steep terrain, other natural disasters can occur, including landslides, mudflows, and floods. Once ground cover has been burned away, little is left to hold soil in place on steep slopes and hillsides.
- Wildland fire is part of the natural ecological process of many ecosystems. The effects of fire can retard or accelerate the natural development of plant communities, alter species diversity, change nutrient flows, and interact with other physical, chemical, and biological systems. Without wildland fires, the ecological health of many forests, rangelands, and wilderness areas decline.
- Wildland fires occur naturally and are one of the many natural sources of airborne particulate matter (tiny particles such as dust, soot, etc.) Particulate matter is the main pollutant of concern from smoke because it can lead to serious health problems. Smoke can also adversely affect the clarity (visual range) of our air.

Sources: NIFC, 2004; FEMA 2004d, Maxim, 2003a, 2003b.

3.3.10.2 History of Wildland and Rangeland Fires in Montana

Wildland and rangeland fires occur every year; they are part of the normal vegetative cycle for forest and grasslands in the state. The frequency at which they occur depends on the forest and vegetation type and the prevailing weather conditions. Historically, vegetation types influenced the fire recurrence intervals, but fire regimes have been altered through fire suppression and changes in the landscape. Fire suppression has increased the amount of fuels available to burn and decreased the separation of fuels, resulting in greater undergrowth and denser vegetation. These changes have increased fire severity and frequency, compared to the fire regime prior to the twentieth century. An added factor in fire recurrence is the weather and drought, including extended periods of low precipitation, insect infestation, and heat that increase the potential severity of a fire season. When these conditions mix with high winds, low humidities, high temperatures, and/or dry lightning storms, the fires can be devastating.

By all historical records, the Great Idaho fire of 1910 in northern Idaho and western Montana was the largest forest fire in American history. The fire burned 3 million acres, killed 86 people, destroyed numerous towns in northern Idaho and western Montana, and by some accounts, most of the destruction occurred in 6 hours. The hurricane winds of August 20 and 21, 1910 turned numerous fires scattered throughout the region into a blow-torch. The fire occurred when the US Forest Service was a fledgling agency that lacked the personnel, equipment, and communications to effectively address wildfire. Even with today's technology and resources devoted to wildland fire fighting, that magnitude of fire could occur again, given similar conditions.

Since 1988, Montana has experienced an increase in the size and intensity of fires. The Greater Yellowstone Fire of 1988 covered 2.3 million acres, employed an estimated 25,000 firefighters, and cost nearly $120 million for fire suppression. One firefighter and one pilot died and structure losses were estimated at $3 million (YPN, 2004). Fires in western Montana in 2000 and 2003 were again devastating, burning 1.2 million acres in 2000 and 730,000 acres in 2003 (MDNRC, 2004b).

Grassland fires in eastern Montana have been equally as devastating. In July 1999, the Fishel Creek Fire threatened the town of Musselshell. The fire burned 33,000 acres, one home and threatened the evacuation of Musselshell. Later that same year, a grassfire burned 18,000 acres and a portion of the town of Outlook, causing $4 million in damages (Maxim, 2003b). In all, about 105,000 acres burned in 5 hours in eastern Montana that night. In July 2003, the Missouri Breaks Complex in Eastern Garfield County burned 130,927 acres and destroyed eight structures and 610 miles of fence.

Table 3.3.10-1 lists some of some of the most serious forest fires in Montana history. Some were significant because of their size, others because of the value of the resources lost or the number of lives lost. Many other fires, too many to mention, have affected the lives and property of Montanans. **Table 3.3.10-2** shows the total number of fires and acreage burned by year in Montana.

Table 3.3.10-1 Historically Significant Wildland Fires in Montana

Date	Name	Location	Acres	Significance	Suppression Costs
1910	Great Idaho	Idaho and Montana	3,000,000	85 Lives Lost	
1949	Mann Gulch	Montana	4,339	13 Smokejumpers Killed	
1988	Greater Yellowstone National Park	Montana, Idaho and Wyoming	2,281,800	Large Amount of Acreage Burned; 52 buildings destroyed or damaged.	$120 Million
1988	Canyon Creek	Montana	250,000	Large Amount of Acreage Burned	
2000	Bitterroot Complex and others	Montana, Idaho, Alaska, Oregon, Washington, Wyoming	8,000,000 nationwide; 1,160,145 in Montana	Large Amount of Acreage Burned	$2.1 Billion nationwide
2003	Various Montana fires	Montana	378,000	5 residences and 3 buildings burned, 2800 buildings threatened	$168.6 Million in Montana

Source: NIFC, 2004; USDA Forest Service, 2003 as of September 10, 2003; NOAA, 2004a; FEMA, 2004d

Table 3.3.10-2 Fire and Burned Acreages in Montana by Year

Year	Fires	Acres
1991	1,496	122,530
1992	1,500	32,787
1993	670	6,055
1994	2,743	281,430
1995	1,113	22,171
1996	1,836	246,498
1997	882	9,731
1998	1,781	117,090
1999	1,932	87,569
2000	2,802	1,160,145
2001	1,463	146,819
2002	1,372	119,309
2003	2,326	736,809

Source: MDNRC (2004b)

3.3.10.3 Declared Disasters and Emergencies from Wildland and Rangeland Fires

Requests for public assistance for wildland and rangeland fires can be from the State and/or Federal level. The Governor of Montana may declare an Executive Order (EO) that will permit the use of State funds or activation of Montana National Guard. FEMA may authorize Fire Management Assistance Grants (FMA), formerly Fire Suppression Assistance (FSA), to local and State agencies for fire suppression. These funds are exclusive of other firefighting costs on Federal land by Federal agencies. In extreme fire years, the Governor may request a Presidentially Declared Disaster for a wildland fire. This has occurred twice: in 1988 for

most of the state; and in 2000 for 3 counties. **Table 3.3.10-3** shows wildfire disasters or emergencies declared in Montana.

Table 3.3.10-3 Montana Disaster Declarations from Wildfire. Sources: MDES, 2003; FEMA, 2004f (2003 data)

Date	Event	Federal	State	Local
August 1, 1979	Forest Fires. National Guard Activation		$8,411	
August 1988	Wildland Fires. All counties in the State.			
August 1, 1990	Wildland Fires (EO 10-90). National Guard Activation.		$7,190	$24,205
	Department of State Lands		$83,252	
November 1, 1990	Wildland Fires (EO 15-90). National Guard Activation. Beartooth Complex, Lewis & Clark County.			
November 1, 1990	Wildland fire (EO 17-90). Turkey Fire, No claim submitted.			
May 1, 1991	Wildland Fires (EO 05-91).			
June 1, 1991	Wildland Fires (EO 10-91).			
October 1, 1991	Wildland Fires (EO 31-91).			
October 1, 1991	Wildland Fires (EO 33-91).		$49,882	
March 1, 1992	Wildland Fires (EO 06-92).			
August 1, 1992	Wildland Fires (EO 15-92).			
July 27, 1994	Wildland Fires (EO 12-94)			
July 27, 1994	Wildland Fires (EO 13-94)			
August 10, 1994	Wildland Fires (EO 14-94)			
August 16, 1994	Wildland Fires (EO 15-94)			
	FEMA-MT-2111-FSA; FEMA to DNRC:	$2,875,413		
	FEMA-MT-2111-FSA; FEMA to DES:	$11,716		
	FEMA-MT-2110-FSA; Wilderness Complex Fire-Lincoln Co., FEMA share to DES:	$16,959		
August 23, 1994	Wildland Fires (EO 17-94) Executive Order amending EO 15-94 to read as a disaster rather than an emergency for the same counties.			
September 9, 1994	Wildland Fires (EO 19-94)			
August 10, 1996	Wildland Fires (EO 20-96)		$11,332	
August 16, 1996	Wildland Fires (EO 21-96)		$151,644	
September 5, 1996	Wildland Fires (EO 23-96)		$3,710	
September 2, 1998	Wildland Fires (EO 15-98) MT DES costs:		$10,663	
	National Guard costs:		$36,300	
July 26, 1999	Wildland Fires (EO 10-99) **FEMA-2266-FSA-MT:** Fishel Creek Complex Fire - Musselshell County; DNRC & FEMA Costs:	$580,729	$388,150	
November 5, 1999	Wildland Fire (EO 17-99) Disaster Declaration for the Town of Outlook. Railroad paid for all the costs that the Town of Outlook incurred.			$126
July 24, 2000	Wildland Fires (EO 17-00) **FEMA-2314-FSA-MT:** FEMA share to MT DES:	$1,274,147		
	FEMA share to National Guard:	$2,594,944		
	FEMA share to DNRC:	$19,699,209		
	County share:			$128,812
July 27, 2000	Wildland Fires (EO 18-00) **FEMA-2317-FSA-MT:** FEMA share to DES	$837,410		
	FEMA share to National Guard:	$208,779		
	FEMA share to DNRC:	$12,292,971		
	County share:			$38,516

Table 3.3.10-3 (continued) Montana Disaster Declarations from Wildfire. Sources: MDES, 2003; FEMA, 2004f (2003 data)

Date	Event	Federal	State	Local
July 27, 2000	**FEMA-2318-FSA-MT** Beaverhead and Madison Counties; FEMA share to MT DES	$50,912		
	FEMA share to National Guard:	$1,048		
	FEMA share to DNRC:	$91,940		
	FEMA share to State:	$4,807		
July 27, 2000	**FEMA-2320-FSA-MT** FEMA share to DES:	$103,366		
	FEMA share to National Guard:	$91,287		
	FEMA share to DNRC:	$5,166,893		
	County share:			$40,378
	FEMA to State:	$5,640		
August 16, 2000	Wildland Fires (EO 20-00) **FEMA-1340-DR-MT:** Federal Share:	$11,579,000		
	FEMA-2321-FSA: FEMA share to DNRC:	$91,940		
	FEMA-2326-FSA: FEMA share to DES:	$70,842		
	County share:			$36,150
	FEMA to State:	$21,483		
August 16, 2001	Wildland Fires (EO 20-01)			
September 3, 2001	Wildland Fires (EO 22-01)			
July 18, 2003	Wildland Fires (EO 14-03).			
	FEMA-2483-FM-MT, Missouri Breaks Complex, Garfield County	$256,726	$76,690	$8,885
	FEMA-2484-FM-MT, Robert Fire, Flathead County	$420,963	$115,082	$25,240
	FEMA-2485-FM-MT, Wedge Canyon Fire, Flathead County	$351,321	$6,730	$110,377
August 7, 2003	Wildland Fires (EO 16-03).			
	FEMA-2488-FM-MT, Hobble Fire, Sweet Grass and Stillwater Counties	$1,094,812	$334,807	$30,130
	FEMA-2489-FM-MT, Cherry Creek Fire, Sanders County	$3,865	$769	$519
	FEMA-2490-FM-MT, Mineral & Missoula Fire Zone & Cooney Ridge Fire Complex, Mineral, Missoula and Ravalli Counties	$9,044,295	$2,944,971	$69,794
	FEMA-2492-FM-MT, Lincoln Complex, Lewis & Clark and Powell Counties	$740,657	$243,476	$3,410
	FEMA-2494-FM-MT, Flathead Fire Zone, Flathead County	$637,540	$130,470	$82,043
Total Costs		**$70,067,336**	**$4,603,529**	**$598,585**

Wildfires have a profound effect on the forest product industry and recreational businesses. The U.S. Small Business Administration (SBA) can make declarations to provide assistance to businesses that are directly affected by forest fires. The SBA issued the following disaster declaration in 2003:

> **2003 SBA Declaration #9W74 – Forest Fire:** Small Businesses in Beaverhead, Broadwater, Carbon, Cascade, Chouteau, Deer Lodge, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Lake, Lewis & Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweetgrass, Teton, Toole, Wheatland, and Yellowstone Counties are eligible to apply for a low-interest Economic Injury Disaster Loan from the SBA. These loans are available to small businesses that have suffered financial losses as a result of Forest

Fires in 2003. These loans cannot address physical damages caused by the disaster (US SBA, 2004).

Photo 3.10-1 Granite Creek, Montana, August 21, 2003 -- Safety Officer Tom Nash from Virginia directs a firefighter crew bus through an area where fires had advanced. Crews were directed to pull back from the Hopeful 2 fire because high winds caused the fire to run. Photo by Andrea Booher/FEMA

Photo 3.10-2 A ball of flames rolls skyward as part of the Fridley Fire engulfs a stand of trees Monday, Aug. 20, 2001 between Fridley and Eightmile Creeks southwest of Livingston, Mont. Erik Petersen/Associated Press. Photo Source: Montanafires.com, 2004.

3.3.10.4 Vulnerability to Wildland and Rangeland Fires

All of Montana is vulnerable in one form or another to wildland and rangeland fires. The probability and severity of fires are highly dependent upon weather conditions and fuel conditions and thus will change from year to year. Fire is predicated on drought conditions, and Montana's wildlands and rangeland is more capable of supporting fires following and during drought years than in "normal" years. Extreme dry periods in Montana have coincided with big fire years. The most severe and extensive fires on record from the first half of the 20th century occurred during periodic droughts, including those of 1889, 1910, 1919, 1926, 1934, and 1967 (Cilimburg & Short, 2003).

Exclusive of weather, other factors can contribute to the probability and intensity of fires, thus making the fires burn hotter, become harder to suppress, and result in structure loss and loss of life. More than 100 years of excluding fire from forested areas, combined with past land-use practices, have altered the landscape. The resulting changes include a heavy buildup of dead vegetation, dense stands of trees, a shift to species that have not evolved and adapted to fire, and, occasionally, even an increase in non-native fire-prone plants. Because of these conditions, today's fires tend to be larger, burn hotter, and spread farther and faster, making them more severe, more dangerous, and more costly in human, economic, and ecologic terms (NIFC, 2004).

In central and eastern Montana, rangelands are also vulnerable to wildfires. Dry grass and sagebrush are highly flammable and can spread fire quickly over a wide area. The USDA Farm Service Agency's (FSA) Conservation Reserve Program (CRP) is a voluntary program available to agricultural producers to help them safeguard environmentally sensitive land. Producers enrolled in CRP establish long-term, resource-conserving covers to improve the quality of water, control soil erosion, and enhance wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Generally, CRP acreage may not be hayed or grazed during the Primary Nesting Season for certain wildlife unless under emergency or managed conditions. Although the CRP may benefit the environment in many respects, the program may also increase the fire risk in nearby communities. (USDA Farm Service Agency, 2004)

3.3.10.4.1 Fire Regimes/Condition Class

To assess the state's vulnerability to fire we need to understand how fire has historically shaped and maintained the forest and grassland ecosystems. Fire is a natural process in Montana's forests and grasslands, but different vegetative communities have different fire patterns or fire regimes. Some vegetative communities burn frequently in low severity fires while others burn less frequently but with great severity and mortality to the dominant overstory vegetation. Schmidt (2002) categorized historic fire regimes into the following five general categories:

Type I	0–35-year frequency	low severity
Type II	0–35-year frequency	stand-replacement severity
Type III	35–100+ year frequency	mixed severity
Type IV	35–100+ year frequency	stand-replacement severity
Type V	200+ year frequency	stand-replacement severity

Frequency describes the average number of years between fires. Severity is the effect of the fire on the dominant overstory vegetation. Low severity is when more than 70% of the understory and 90% of the overstory vegetation survives. Mixed severity is when there is mixed severity of the overstory and typically resulting in mosaic burn patterns. Stand-replacement severity results in mortality to over 90% of the overstory and 80% of the understory vegetation (Schmidt, 2002).

Ponderosa Pine forests in lower elevations of western Montana are considered Type I fire regimes. Grasslands and rangelands in central and eastern Montana are considered Type II fire regimes, because fire normally burns most of the vegetation. Forests in the upper elevations of western and central Montana that include Subalpine fir and Engleman spruce are considered Type V because fire is infrequent, but when it occurs it results in high mortality.

When land use and fire suppression interrupt historic fire regimes, vegetation densities increase and fire fuels can build-up. These changes can alter the size of fires, the intensity of the fires, and its potential severity. For example, if fire is suppressed in ponderosa pine forests, the understory may begin to support Douglas fir in dense patterns. When fire occurs, the increased fuels generate hotter fires that may result in mortality to ponderosa pines which are normally fire resistant. Changes in these fire patterns are identified as fire condition classes. The greater departure from normal historic fire regimes result in an increasing fire condition class as described below:

Condition Class 1 Fire regimes are within an historical range and the risk of losing key ecosystem components is low.

Condition Class 2 Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.

Condition Class 3 Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range (from Schmidt, 2002).

Schmidt (2002) mapped the fire condition class across the country in 1 km grid cell size. **Figure 3.3.10-1** shows the Montana portion of the mapping. Please note that this methodology may not accurately represent the conditions in specific locations, but provides a broader picture of the entire state. Local hazard assessments provide greater detail on the specific wildfire hazards in each community.

3.3.10.4.2 Statewide Vulnerability to Wildland and Rangeland Fires

As identified above, all of Montana is vulnerable to fire. In any given year, wildfire can break out in any part of the state and impact rangelands, grasslands, and forests. They can endanger the communities that have developed in the wildland/urban interface and firefighters that must contain and prevent losses. Those areas where land use practices, fire suppression, and/or insect infestations have changed the fire condition class may be more vulnerable to the impacts from fire. Fires in these areas may burn hotter, may be more unpredictable, and have a greater potential for stand replacement severity. These types of fires may also reduce the abilities of firefighters to contain losses and may expose those fighting fires and living near fires to increased risks.

Counties with increased vulnerabilities may be those with high percentages of forest land under fire class condition II and III or those counties with a high percentage of cropland in the federal Conservation Reserve Program (CRP). **Table 3.3.10-4** identifies counties that have more than 40% of total land area mapped as fire condition class II and III. **Table 3.3.10-5** identifies the counties with more than 20% of cropland in CRP. These counties are shown on **Figure 3.3.10-2**

Table 3.3.10-4 Counties with Highest Acreage Class II/III Condition Class
Source: Schmidt, 2002.

County	County	Condition Class II		Condition Class III	
	Total Acres	Acres	% Area	Acres	% Area
Flathead	3,354,005	1,083,804	32.31%	1,660,054	49.49%
Lincoln	2,344,762	934,800	39.87%	704,745	30.06%
Missoula	1,671,175	892,792	53.42%	474,937	28.42%
Carbon	1,316,784	855,232	64.95%	25,946	1.97%
Ravalli	1,532,324	847,819	55.33%	392,156	25.59%
Sanders	1,780,466	739,339	41.53%	692,883	38.92%
Lewis & Clark	2,232,434	641,980	28.76%	356,573	15.97%
Powell	1,488,960	626,906	42.10%	384,743	25.84%
Granite	1,106,345	569,578	51.48%	258,472	23.36%
Mineral	780,785	353,361	45.26%	232,279	29.75%
Lake	1,055,355	243,399	23.06%	257,237	24.37%
Silver Bow	459,008	176,186	38.38%	55,599	12.11%
Deer Lodge	473,151	170,503	36.04%	45,467	9.61%

Table 3.3.10-5 Counties with >20% Cropland Under CRP
Source: USDA, Farm Service Agency, 2004.

County	County	Cropland	Current Active CRP		
	Total Acres	Total Acres	Acres	% Cropland	% County
Daniels	912,715	591,902	148,051	25.01%	16.22%
Hill	1,865,477	1,217,393	300,522	24.69%	16.11%
Liberty	925,755	627,750	139,023	22.15%	15.02%
Sheridan	1,091,671	705,809	158,775	22.50%	14.54%
Toole	1,244,848	705,972	178,888	25.34%	14.37%
Roosevelt	1,515,444	781,018	172,377	22.07%	11.37%
Teton	1,465,710	597,232	152,016	25.45%	10.37%
McCone	1,715,096	567,418	143,697	25.32%	8.38%
Valley	3,237,540	840,810	209,585	24.93%	6.47%
Wibaux	568,968	170,950	36,302	21.24%	6.38%
Dawson	1,523,385	465,669	93,540	20.09%	6.14%
Blaine	2,711,308	684,743	162,854	23.78%	6.01%
Golden Valley	752,063	190,092	45,166	23.76%	6.01%
Phillips	3,333,350	628,501	169,580	26.98%	5.09%
Prairie	1,113,873	164,939	39,073	23.69%	3.51%
Musselshell	1,196,012	161,546	41,100	25.44%	3.44%
Richland	1,344,527	513,121	118,906	23.17%	8.84%

In addition to the above county analysis, the BLM completed a communities at risk analysis across the state, identifying fire risk factors immediately around Montana communities (Dannenberg, 2004). Data was collected on vegetation, slope, aspect, weather factors, development density, and building materials within a 5-mile radius of 622 towns and cities in Montana. The assessment method was adapted from the "*Wildland/Urban Interface Fire Hazard Assessment Methodology*" as developed by the National Wildland/Urban Interface Fire Protection Program, 1998 (Firewise, 2004).

The results of the BLM communities risk assessment showed that 241 of the 622 communities in Montana (38.8%) were rated with an extreme or high fire danger rating. These communities and their relative risk to wildfire and rangeland fire are shown on **Figure 3.3.10-2.**

Figure 3.3.10-1 Fire Condition Class

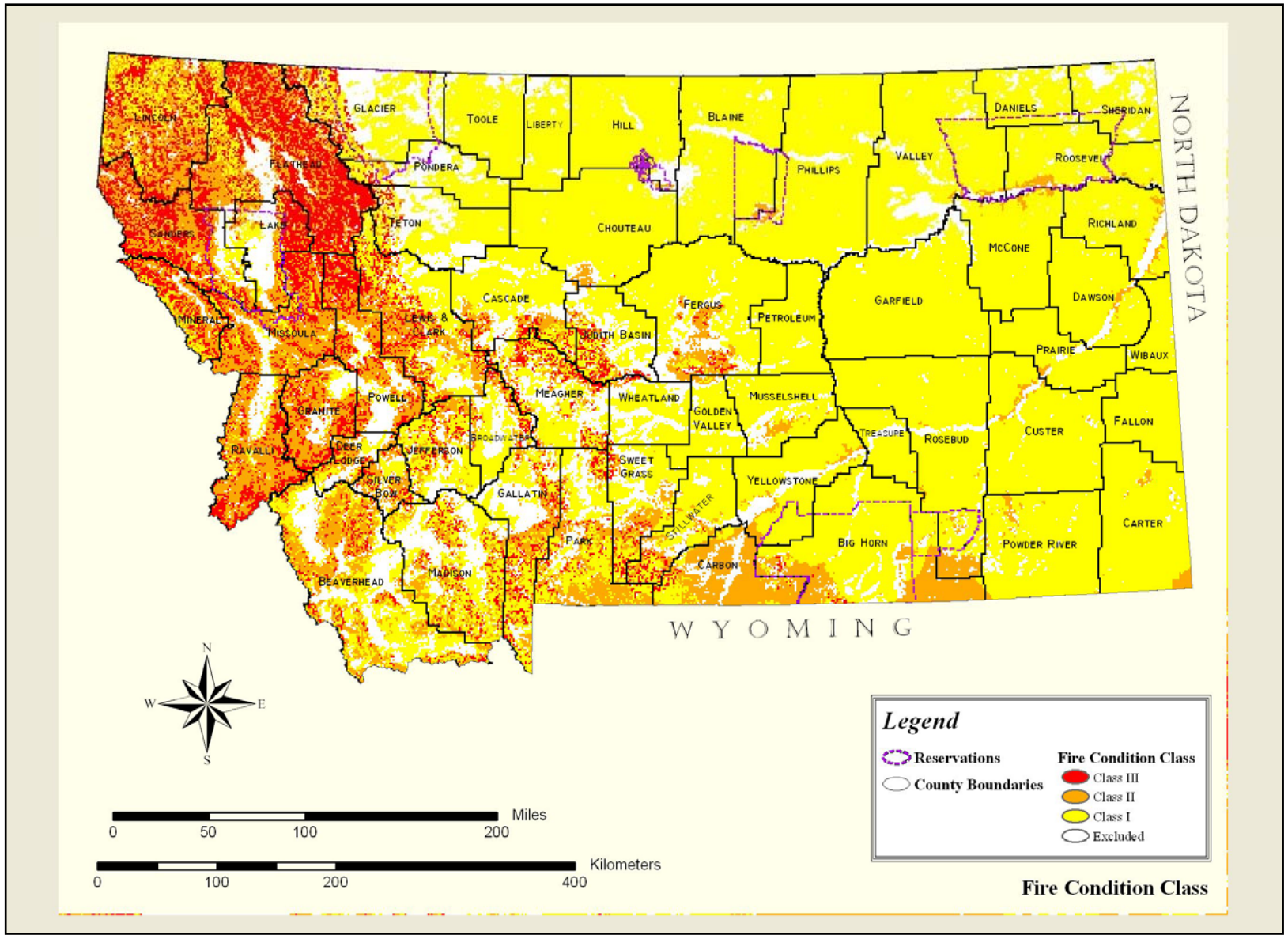
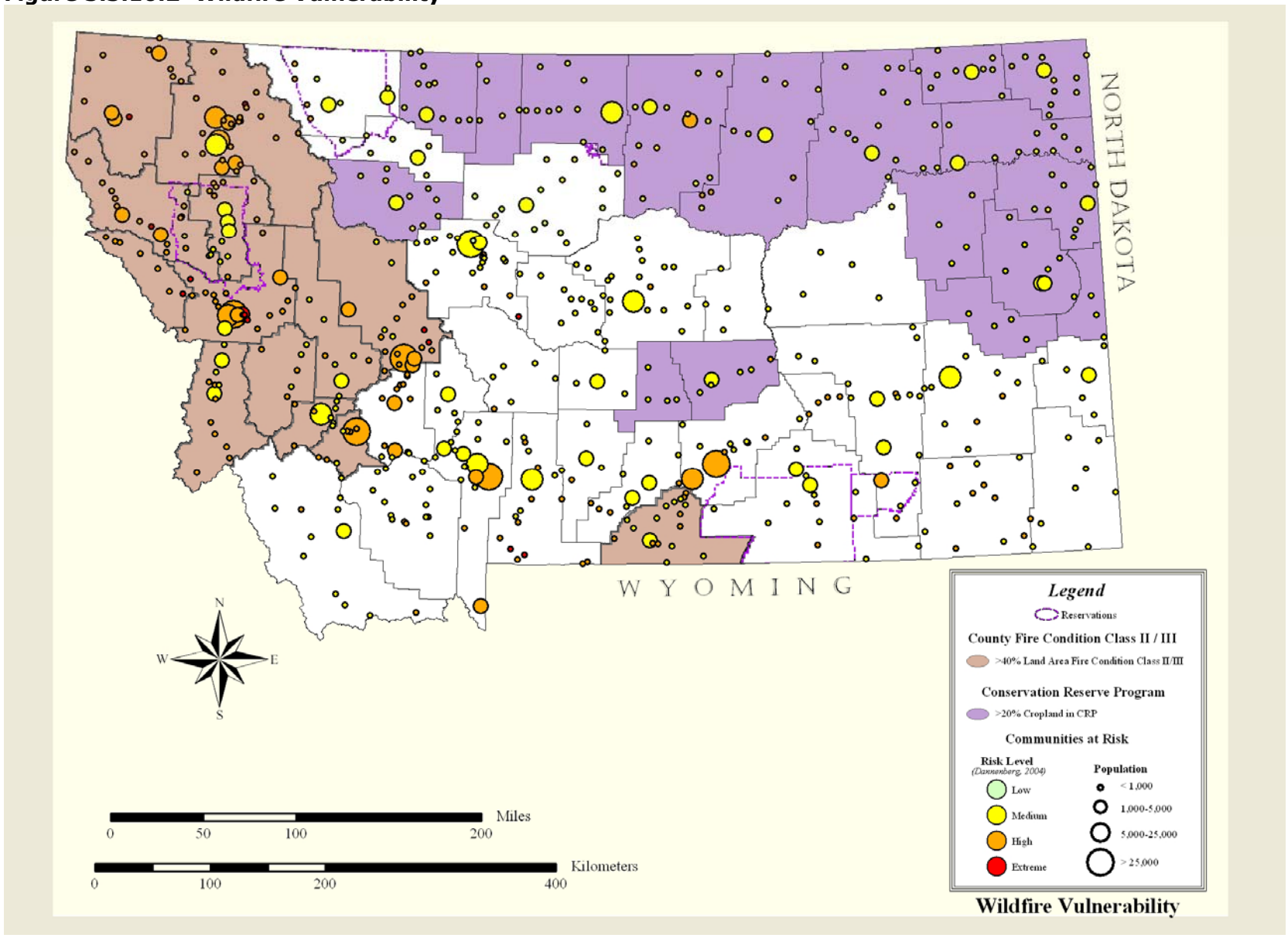


Figure 3.3.10.2 Wildfire Vulnerability



3.3.10.4.3 Review of Potential Losses in Local PDM Plans

Of the 6 counties that have completed local PDM Plans, 5 identified wildfire as a significant hazard, and 3 identified it as one of the top three hazards.

- Broadwater County ranked wildfire as the second-highest hazard within the county with the potential to have a moderate impact on the population and economy. Wildfire could cause up to **$3.5 million** in property damage.
- Daniels County identified wildfire as a very frequent hazard and estimated approximately **$9 million** in building value is at risk in the county.
- Valley County determined building risk to wildfire was estimated to be **$22 million.** The County ranked wildland fire third among hazards in relation to building risk.

3.3.10.4.4 Vulnerability to State Property

While structure loss can occur from wildland fire, most of the losses are related to timber and crop resources and the potential loss of life. State property that could be vulnerable to wildland fires includes leased cropland and State forest property. Leased cropland returns approximately **$14 million** annually to the State. Timber production from State-owned timber tracts returned **$7 million** in FY 2003. The exposure of leased cropland and timber lands is low, as the return from these properties is relatively small.

State buildings located in counties with a high vulnerability to wildfire are considered to be indirectly exposed to wildfire. Those counties include two universities, the Capitol Complex, and state prison. **Table 3.3.10-6** identifies the structure and content value of state-owned facilities in those counties shown in **Figure 3.3.10-2**.

Table 3.3.10-6 State Building Values in Counties Highly Vulnerable to Wildland Fires (State-Owned Building/Content value in dollars)

County	Building Value	Contents Value	Total Value	FTEs
Carbon	$1,010,481	$216,204	$1,226,685	21
Deer Lodge	$49,981,239	$9,240,703	$59,221,942	469
Flathead	$28,929,471	$7,916,880	$36,846,351	438
Granite	$310,654	$70,163	$380,817	5
Lake	$3,424,220	$1,093,218	$4,517,438	75
Lewis and Clark	$254,998,224	$125,124,161	$380,122,385	6,283
Lincoln	$2,857,248	$1,328,529	$4,185,777	69
Mineral	$525,092	$251,597	$776,689	7
Missoula	$391,640,945	$151,210,662	$542,851,607	3,375
Powell	$62,140,542	$12,434,271	$74,574,813	456
Ravalli	$8,129,730	$1,892,662	$10,022,392	67
Sanders	$913,908	$570,585	$1,484,493	33
Silver Bow	$72,856,024	$33,575,041	$106,431,065	398
Totals	**$877,717,778**	**$344,924,676**	**$1,222,642,454**	**11,696**

From PCIIS database (2004), Montana Department of Administration, Risk Management & Tort Defense Division.

3.3.10.5 Wildland and Rangeland Fires Data Limitations

Assessing the wildland and rangeland fire hazard is greatly limited by the data currently available. Wildfires are dependent on so many factors that determining the vulnerability to a community is rather subjective and relies on a complex combination of variables. In addition, in a state such as Montana, with mountains in the west and grasslands to the east, a method to assess one area does not work on another. Therefore, the ability to conduct a comprehensive, statewide assessment is rather limited. In addition, to effectively

determine vulnerability of State property, data identifying locations of State buildings is necessary. The current PCIIS building database is not geo-referenced and cannot be effectively related to spatial coordinates except in general locations (by city or zip code centroid).

3.3.10.6 Wildland and Rangeland Fires References

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